POLICY ISSUE
(Information)

January 17, 1985 SECY-85-17

For: The Commissioners

From: William J. Dircks, Executive Director for Operations

Subject: UPDATE ON ACCIDENT SOURCE TERM REASSESSMENT

Purpose: To inform the Commissioners of the current status of the staff's efforts to reevaluate accident source terms.

Category: This is an information paper.

Background: In 1983 the Accident Source Term Program Office was formed in the Office of Nuclear Regulatory Research to focus and direct the staff's efforts to reassess the basic assumptions and the methodology for quantitative assessment of the releases of radionuclides resulting from core damage accidents (SECY-83-219). The clear need for thorough and extensive peer review resulted in a grant to the American Physical Society (APS) for a formal, broad-based review of the underlying scientific bases, in addition to the expert peer review of models and calculations, as described in SECY-83-219A. An informal status report was provided in my memorandum of June 19, 1984. A further status report, including schedule for completion and publication of the staff efforts was presented in SECY-84-395 (October 12, 1984). This paper provides an update of the schedule for this work to take into account the revised schedule for the completion of the APS review and to describe the staff's near term plans for regulatory use of the new source term information.

Contact:
Melvin Silberberg, ASTPO, RES
Telephone# 427-4737

NMM-RES

Discussion: Status of the Peer Review

The independent review of the scientific basis of source term estimation by the American Physical Society (APS) Study Group is nearing completion. A report describing the findings of the Study Group was submitted in late December 1984 to the APS Executive Council and a 4-person Review Committee, appointed by the Executive Council. The Review Committee will report to the Executive Council on January 20, 1985. Assuming only minor changes in the report, the Chairperson of the Study Group, Professor Richard Wilson of Harvard University, is scheduled to brief the Commission on February 21, 1985.

Status of Related Efforts by Other Organizations

The work of the ANS Special Committee on Source Terms was completed in November 1984 with the publication of a final report and a Commission briefing held on November 13, 1984. The Industry Degraded Core Rulemaking (IDCOR) Program, sponsored by the Atomic Industrial Forum, recently completed a 4-year study of nuclear power plant risks, and has published a final technical report in December 1984. The IDCOR Policy Group has approved continuation of their program in an Implementation/ Source Term phase through 1985. The objectives and milestones of this next phase were presented at an NRC-IDCOR management meeting on December 17, 1984. Briefly, the goal of the next phase of the IDCOR Program is to effect regulatory closure and reform in the areas of severe accident source terms and emergency planning. The milestones for NRC-IDCOR interaction in 1985 proposed by IDCOR are:

- February 19, 1985 - IDCOR-NRC discuss outstanding technical issues
- March 19, 1985 - IDCOR-NRC discuss generic applicability process
- April 1985 - IDCOR-NRC agree on process
- June 1985 - NRC staff issues letter on generic applicability and schedule for implementation

This schedule is probably too optimistic and the staff may be resource limited. We intend to iterate with IDCOR during the February 19 meeting.

Status of Containment Failure Mode Review

In WASH-1400 the containment failure mode, α, resulting from a steam explosion was assigned a conditional probability of 10^{-2}, given a core melt accident. In 1981 a review (NUREG-0850) of the α failure mode conducted in a support of the Indian Point Hearings concluded that on the basis of additional information available since WASH-1400, the probability was on the order of 10^{-4}. With this background at hand, the Containment Loads Working Group (formed in 1983 in support of the source term reassessment effort) decided not to consider steam explosion loads within the scope of its effort.

A recent report published by Sandia (Summer 1984) entitled "An Uncertainty Study of PWR Steam Explosions," NUREG/CR-3369 raised sufficient questions to warrant another review of the subject. A Steam Explosion Review Group (SERG) comprised of U.S. and foreign experts was formed and a meeting was held on November 27 and 28, 1984 to address: (1) the best estimate probability of containment failure resulting from a steam explosion, (2) the findings in NUREG/CR-3369, and the proposed research in this area. Best estimate values for containment failure probability reported by the SERG members range from 10^{-6} to less than 10^{-2}. Some SERG members provided upper limits to their best estimates, with one member reporting an upper limit value of 10^{-1}. A summary report on the results and conclusions from the SERG meeting is in preparation by the SERG Chairperson and is expected to be issued in early January 1985.

Status of Staff's Assessment

The staff's assessment and conclusions concerning the contractors' products will be contained in a NUREG report (NUREG-0956). The primary purpose of NUREG-0956 will be to assess the extensive body of new information with respect to its validity and potential applicability to the regulatory process, particularly in view of uncertainties still associated with the BMI-2104 methodology. Representative calculations for a number of accident sequences for different reactor types and containments will be summarized and reviewed with respect to the potential impact of the results on the estimates of the risks associated with severe reactor accidents.

This report (NUREG-0956), currently in preparation, will take into account the findings of the APS Study Group Report, as well

as similar or related efforts by the IDCOR Program and the ANS. The major milestones for its completion and publication are shown in Table 1.

Please note that this proposed schedule includes a review by the ACRS, followed by a presentation to the Commission on or about May 15, 1985, prior to publication for public comment.

Regulatory Use of New Source Term Information

The source term technology report (NUREG 0956) will be accompanied by a staff paper which will assess for the Commission the regulatory significance of the revised source term technology for each of the principal areas of reactor regulation. The staff will identify those parts of the regulations and related standards where changes to reflect new source term knowledge appear to be warranted. This paper will not actually propose rule changes or Commission action, but only identify and discuss possible rulemaking activities. One of those rulemaking activities, revisions to the reactor emergency preparedness regulation (10 CFR Part 50.47, etc.) began in 1983, but, as I informed you in my memorandum of June 19, 1984, was held in abeyance to await the revised source term information.

William J. Dircks
Executive Director
for Operations

Enclosure:
Table 1

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Major Milestones for Completion and Publication

of NUREG-0956

-	Report of APS Study Group to Commission	February 21, 1985
-	Completion of Draft NUREG-0956 (including incorporation of comments and amendments as a result of APS report)	April 9, 1985
-	Transmittal to ACRS for review	April 15, 1985
-	Commission Paper prepared	May 3, 1985
-	Commission Meeting, on or about	May 15, 1985
-	Publication of Draft NUREG-0956 for Public Comment	May 24, 1985
-	60-Day Comment Period Complete	July 23, 1985
-	Incorporation of Comments and Ready for Final Publication	August 1985